

State of California
AIR RESOURCES BOARD

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES
FOR 2001 MODEL YEAR AND LATER
SPARK-IGNITION MARINE ENGINES

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Amended: July 21, 2002
Amended: (September 22, 2006)

FINAL REGULATION ORDER TEST PROCEDURES

Note: This document is printed in a style to indicate changes from the existing provisions. All existing language is indicated by plain type. All additions to language are indicated by underlined text. All deletions to language are indicated by ~~strikeout~~. Only those portions containing the suggested modifications from the existing provisions are included. All other portions remain unchanged and are indicated by the symbol “* * * *” for reference.

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES
FOR 2001 MODEL YEAR AND LATER SPARK-IGNITION MARINE ENGINES

**Part I. Emission Regulations for 2001 and Later New Spark-Ignition
Marine Engines, General Provisions.**

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**9. Exhaust Emission Standards for 2001 and Later Spark-Ignition Marine
Engines.**

(a) Model year 2001 and later model year spark-ignition personal watercraft
and outboard marine engines:

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(b) Model year 2003 and later model year spark-ignition inboard and
sterndrive marine engines:

(1) Exhaust emissions from new model year 2003 and later spark-ignition
inboard and sterndrive marine engines must not exceed the exhaust
emission standards listed in Table 2 for the designated emission durability
test period. Prior to Model Year 2007 certification, each engine
manufacturer must select either Option 1 (OPT 1) or Option 2 (OPT 2) for its
entire production for the 2007 and 2008 model years.

Table 2.

Inboard and Sterndrive Exhaust Emission Standards (by Implementation Date)		
Model Year	HC+NO_x (grams per kilowatt-hour)	Durability Test Period (hours)
2003-2008 ¹	16.0 ²	—
2007 and Later ³	5.0	480

- ~~1. Engines with a maximum rated power exceeding 373 kilowatts (500 horsepower) are not required to comply with these standards.~~
- ~~2. Compliance with the HC+NO_x standard may be averaged on a sales weighted basis, across the engine manufacturers' California production, based on~~

~~projected California sales or the projected California percentage of national sales.~~

3. ~~For model year 2007, engine manufacturers shall certify a minimum of 45% of their California production (projected California sales or projected California percentage of national sales) to the standard. For model year 2008, engine manufacturers shall certify a minimum of 75% of their California production (projected California sales or projected California percentage of national sales) to the standard.~~

Inboard/Sterndrive Marine Engine Standards

<u>MODEL YEAR</u>	<u>RATED POWER</u> [kilowatts]	<u>COMPLIANCE OPTION</u>¹	<u>DURABILITY</u> [hours / years]	<u>EXHAUST STANDARD</u>		<u>SUPPLEMENTAL MEASURE</u>⁴
				<u>NMHC²+NOx</u> [grams per kilowatt-hour]	<u>TYPE</u>³	
<u>2003 - 2006</u>	<u>kW ≤ 373</u>	<u>N/A</u>	<u>N/A</u>	<u>16.0</u>	<u>AVE</u>	<u>None</u>
<u>2007</u>	<u>kW ≤ 373</u>	<u>OPT 1</u>	<u>N/A</u>	<u>16.0 (55%)</u>	<u>AVE</u>	<u>None</u>
			<u>480 / 10</u>	<u>5.0 (45%)</u>	<u>FIXED</u>	
<u>2008</u>	<u>kW ≤ 373</u>	<u>OPT 2</u>	<u>N/A</u>	<u>14.0</u>	<u>FIXED</u>	<u>Low-Permeation Fuel Line Hoses</u>
			<u>N/A</u>	<u>14.0</u>	<u>FIXED</u>	
		<u>OPT 1</u>	<u>N/A</u>	<u>16.0 (25%)</u>	<u>AVE</u>	<u>None</u>
			<u>480 / 10</u>	<u>5.0 (75%)</u>	<u>FIXED</u>	
<u>2009 and later</u>	<u>kW ≤ 373</u>	<u>N/A</u>	<u>480 / 10</u>	<u>5.0⁶</u>	<u>FIXED</u>	<u>Carryover⁷</u>
	<u>373 < kW ≤ 485</u>		<u>150⁵ / 3</u>	<u>5.0⁶</u>	<u>AVE</u>	
	<u>kW > 485</u>		<u>50⁵ / 1</u>	<u>5.0⁶</u>	<u>AVE</u>	

Notes:

1. Once a manufacturer has chosen an option, that option must continue to be used exclusively across product lines
2. The non-methane component of hydrocarbon
3. Corporate averaging (AVE) may be used to demonstrate compliance with the exhaust emission standard, except where a FIXED standard is required
4. Supplemental measures may be different than shown, but must provide equal and verifiable emission reductions to those indicated
5. For the purpose of durability testing, engine components that have been approved with an hourly warranty period shorter than the full hourly durability period per § 2445.1 (c)(3)(C)4. may be replaced at the specified warranty interval
6. All engines ≤ 373 kW must meet a 5.0 g/kW-hr NMHC+NOx capping standard. For engines > 373 kW, the standard may be met by sales-averaging with engines equal to or less than 373 kW
7. The same or better supplemental emission control hardware used to meet the standard in 2007 must be used every model year thereafter

(A) No crankcase emissions shall be discharged into the ambient atmosphere from 2003 and later spark-ignition inboard and sterndrive marine engines.

(B) Production and sale of spark-ignition marine engines that result in noncompliance with the California standard for the model year shall cause an engine manufacturer to be subject to: revocation or suspension of

Executive Orders for the applicable engine families; enjoinder from any further sales, or distribution, of such noncompliant engine families, in the State of California pursuant to section 43017 of the Health and Safety Code; and all other remedies available under Part 5, Division 26 of the Health and Safety Code. Before seeking remedial action against the engine manufacturer, the Executive Officer will consider any information provided by the equipment manufacturer.

(C) For each engine family, the engine manufacturer shall submit the total number of engines produced for sale in California, or the total number of engines produced for sale nationally, ninety (90) days after the end of the model year.

(2) Compliance with the standards on a corporate averaging basis is calculated as follows:

$$\frac{\sum (PROD_{jx})(EL_{jx})}{\sum (PROD_{jx})} = \text{Corporate Average}$$

where:

n = Total number of engine families available for averaging

PROD_{jx} = Number of engines in engine family j produced for sale in California in model year x.

EL_{jx} = The measured NMHC+NOx emission levels for engine family j in model year x; or for engines > 485 kW, the manufacturer may choose to use 30 g/kW-hr as per paragraph (F) below.

(A) During the engine manufacturer's production year, for each engine family, the engine manufacturer shall provide the Executive Officer within 45 days after the last day in each calendar quarter the total number of spark-ignition marine engines produced for sale in California and their applicable EL(s).

(B) The Executive Order certifying the California production for a model year must be obtained prior to the issuance of certification Executive Orders for individual engine families for the model year.

(C) The engine manufacturer's average NMHC+NO_x exhaust emissions must meet the corporate average standard at the end of the engine manufacturer's production for the model year. At the end of the model year, the manufacturer must calculate a corrected corporate average using sales or eligible sales rather than projected sales.

(D) Production and sale of spark-ignition marine engines that result in noncompliance with the California standard for the model year shall cause an engine manufacturer to be subject to: revocation or suspension of Executive Orders for the applicable engine families; enjoinder from any further sales, or distribution, of such noncompliant engine families, in the State of California pursuant to section 43017 of the Health and Safety Code; and all other remedies available under Part 5, Division 26 of the Health and Safety Code. Before seeking remedial action against the engine manufacturer, the Executive Officer will consider any information provided by the engine manufacturer.

(E) For each engine family, the engine manufacturer shall submit California sales data within one hundred eighty (180) days after the end of the model year.

(F) Engines exceeding 485 kilowatts maximum rated power: In lieu of exhaust emission testing, manufacturers may certify using a default exhaust emissions level of 30.0 grams per kilowatt-hour of NMHC+NO_x in their corporate averaging calculation.

(3) Requirements of engine manufacturers and boat manufacturers under Option 2 and using Low Permeation Fuel Line Hose:

(A) Each engine manufacturer that chooses Option 2 must provide written instructions, as part of the installation materials provided to purchasers of the engine, to use Low Permeation Fuel Line Hose for the primary fuel line connecting the fuel tank to the engine of any boat that is manufactured for sale, sold, or offered for sale in California, or that is introduced, delivered or imported into California for introduction into commerce.

(B) Each boat manufacturer must install Low Permeation Fuel Line Hose for the primary fuel line connecting the fuel tank to the engine of any boat that is manufactured for sale, sold, or offered for sale in California that uses an engine from a manufacturer that chooses Option 2.

(4) Supplemental Measures. Prior to Model Year 2007 certification, manufacturers choosing Option 2 may request Executive Officer approval of a supplemental measure as an alternative to meeting the requirements of paragraph (b)(3). In determining whether to approve a request, the Executive Officer will consider the following:

(A) Whether the proposed supplemental measure would achieve reductions in NMHC+NOx equivalent to using Low-Permeation Fuel Line Hoses.

(B) The engine manufacturer's measures to ensure successful implementation of the proposed supplemental measure.

(C) The durability of the proposed supplemental measure, and

(D) Any additional information the Executive Officer deems relevant.

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